

IN THE CLAIMS

Amend Claims 1, 3, 12, 16 and 18-22 as follows and add Claim 23:

1. (Currently amended) Fluid sensor containing a fluid cell (1) to enclose a volume of fluid (7), i.e. gas or liquid to be analyzed, said fluid sensor comprising an electromagnetic energy source (3) arranged to transmit electromagnetic waves (4) into the fluid cell (1),

at least one detector (5) to detect electromagnetic waves passing through the fluid cell (1) and situated directly downstream of said energy source (3) without any curves in said fluid cell (1),

at least one opening (2) for the inlet/outlet of fluid to be analyzed, and a circuit board (8, 10, 11, 12, 13, 14, 15, 16) to evaluate the intensity of electromagnetic waves reaching said at least one detector (5) and/or to provide the circuitry for the electromagnetic energy source (3),

at least part of the straight fluid cell (1) being incorporated into the substrate of the circuit board (8, 10, 11, 12, 13, 14, 15, 16).

2. (Previously Presented) Fluid sensor according to claim 1, which is a gas sensor.

3. (Currently amended) Fluid sensor containing a fluid cell (1) to enclose a volume of fluid (7), i.e. gas or liquid to be analyzed, said fluid sensor comprising an electromagnetic energy source (3) arranged to transmit electromagnetic waves (4) into the fluid cell (1),

at least one detector (5) to detect electromagnetic waves passing through the fluid cell (1),

at least one opening (2) for the inlet/outlet of fluid to be analyzed, and
a circuit board (8, 10, 11, 12, 13, 14, 15, 16) to evaluate the intensity of
electromagnetic waves reaching said at least one detector (5) and/or to provide the
circuitry for the electromagnetic energy source (3).

at least part of the fluid cell (1) being incorporated into the substrate of the circuit
board (8, 10, 11, 12, 13, 14, 15, 16) according to claim 4, and
which is a liquid sensor.

4. (Previously Presented) Fluid sensor according to claim 1, wherein at least part of the internal walls of the fluid cell (1) are coated with a material (9) that is reflective to the electromagnetic waves (4) passing through the fluid cell (1).

5. (Previously Presented) Fluid sensor according to claim 4, wherein at least part of the internal walls of the fluid cell (1) are coated with a metal such as gold or silver.

6. (Previously Presented) Fluid sensor according to claim 1, wherein the electromagnetic energy source (3) and/or said at least one detector (5) is/are mounted on the circuit board (8, 10, 11, 12, 13, 14, 15, 16).

7. (Previously Presented) Fluid sensor according to claim 1, wherein the electromagnetic energy source (3) is a light source, such as an infrared light source and said at least one detector (5) is an optical detector.

8. (Previously Presented) Fluid sensor according to claim 1, wherein the circuit board of the fluid sensor comprises a heat-generating component in the vicinity of the fluid cell.

9. (Previously Presented) Fluid sensor according to claim 1, wherein the fluid cell extends through the circuit board (8, 10, 11, 12, 13, 14, 15, 16) and/or across the circuit board.

10. (Previously Presented) Fluid sensor according to claim 1, wherein the fluid cell (1) is fully embedded in the substrate of the circuit board (8, 10, 11, 12, 13, 14, 15, 16).

11. (Previously Presented) Fluid sensor according to claim 1, wherein the fluid cell (1) extends along a surface of the circuit board (8, 10, 11, 12, 13, 14, 15, 16).

12. (Currently amended) Fluid sensor containing a fluid cell (1) to enclose a volume of fluid (7), i.e. gas or liquid to be analyzed, said fluid sensor comprising an electromagnetic energy source (3) arranged to transmit electromagnetic waves (4) into the fluid cell (1),

at least one detector (5) to detect electromagnetic waves passing through the fluid cell (1),

at least one opening (2) for the inlet/outlet of fluid to be analyzed, and a circuit board (8, 10, 11, 12, 13, 14, 15, 16) to evaluate the intensity of electromagnetic waves reaching said at least one detector (5) and/or to provide the circuitry for the electromagnetic energy source (3),

at least part of the fluid cell (1) being incorporated into the substrate of the circuit board (8, 10, 11, 12, 13, 14, 15, 16) according to claim 1,

wherein the fluid cell (1) is built up of a plurality of circuit boards (8, 10, 11, 12, 13, 14, 15, 16) stacked together.

13. (Previously Presented) Fluid sensor according to claim 1, comprising a plurality of fluid cells (1) incorporated into the substrate of the circuit board (8, 10, 11, 12, 13, 14, 15, 16).

14. (Previously Presented) Fluid sensor according to claim 13, wherein the plurality of fluid cells (1) comprises at least one test channel to determine the attenuation at a wavelength not influenced by a fluid (7) to be analyzed, but close to the fluid (7),

to provide a measure of the variation of the electromagnetic signal influenced by environmental parameters and not by the analyzed fluid.

15. (Previously Presented) Fluid sensor according to claim 1, comprising a flexible circuit board (8, 10, 11, 12, 13, 14, 15, 16).

16. (Previously Presented) Method for producing a fluid sensor having a fluid cell (1), comprising the step of

forming a straight trench having at least one substantially smooth surface in the substrate of a circuit board (8, 10, 11, 12, 13, 14, 15, 16) which will constitute at least part of a fluid cell (1).

17. (Previously Presented) Method according to claim 16, comprising the further step of coating at least part of the, or each, wall of the trench with a material (9) that is reflective to the electromagnetic waves (4) that pass through the fluid cell (1), such as metal.

18. (Currently amended) Method for producing a fluid sensor having a fluid cell (1), comprising the step of

forming a trench having at least one substantially smooth surface in the substrate of a circuit board (8, 10, 11, 12, 13, 14, 15, 16) which will constitute at least

part of a fluid cell (1) ~~according to claim 16, and~~ comprising the further step of stacking a plurality of circuit boards (8, 10, 11, 12, 13, 14, 15, 16) together to form a fluid cell (1).

19. (Currently amended) ~~Method of using a~~ A fluid sensor according to claim 1, ~~comprising the step of~~ structured and arranged for determining the concentration of a gas (7) such as carbon dioxide, carbon monoxide, a hydrocarbon, nitrous oxide or a liquid hydrocarbon or any other gas or liquid having attenuation bands in the infrared range.

20. (Currently amended) ~~Method of using a~~ A fluid sensor according to claim 1, ~~comprising the step of~~ structured and arranged for determining the concentration of carbon dioxide in the exhaled air of a person or a person's breathing frequency.

21. (Currently amended) ~~Method of using a~~ A fluid sensor according to claim 1 ~~as~~ which is a trace gas or liquid meter.

22. (Currently amended) ~~Method of using a~~ A fluid sensor according to claim 1, ~~comprising the step of~~ structured and arranged for determining the pressure, structure or composition of a gas or liquid.

23. (New) A fluid sensor according to claim 1, wherein said fluid cell (1) extends entirely across the circuit board (8, 10, 11, 12, 13, 14, 15, 16) with said at least one opening (2) adjacent an edge of the circuit board (8, 10, 11, 12, 13, 14, 15, 16) and said detector (5) situated in an opening through an opposite edge of the circuit board (8, 10, 11, 12, 13, 14, 15, 16).